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**United States Patent** (19)

Murata

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[54] RECEIVED DATA PROCESSING SYSTEM  
FOR RECEIVING PERFORMANCE DATA  
HAVING REMOVABLE STORAGE

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**Related U.S. Application Data**

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**[30] Foreign Application Priority Data**

Feb. 21, 1992 [JP] Japan 4-72638  
Feb. 27, 1992 [JP] Japan 4-76054

[51] Int. Cl.<sup>6</sup> G06K 15/00

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[58] Field of Search 364/514 A, 400.01;  
84/602, 609, 622, 610, 626, 613, 629, 630,  
645, 647, 649, 659

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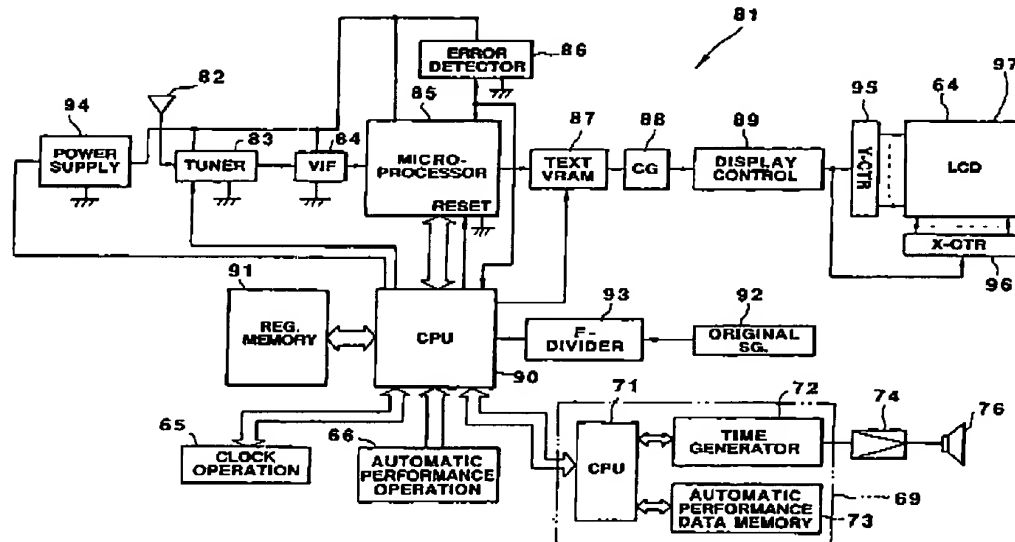
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**[57] ABSTRACT**

A received data processing system is composed of a transmitter which includes a transmission unit which sends by radio sensor data such as a pulse rate obtained by a pulse sensor, a wrist watch which receives the sensor data from the transmitter using a reception unit and displays it on a display, and an external storage attached removably to the wrist watch for storing the received sensor data. Since the transmitter is attached closely to the human body to sense a pulse rate, detection of the pulse rate is ensured even if the user is in exercise. Since data on the pulse rate is stored in the removable external storage through the wrist watch, the system can process a large amount of data.

25 Claims, 15 Drawing Sheets





US006034314A

(4)

**United States Patent** [19]**Koike**[11] **Patent Number:** **6,034,314**[45] **Date of Patent:** **Mar. 7, 2000**[54] **AUTOMATIC PERFORMANCE DATA  
CONVERSION SYSTEM**

5,831,192 11/1998 Watari et al. 84/600

**FOREIGN PATENT DOCUMENTS**[75] **Inventor:** Masahiko Koike, Hamamatsu, Japan0 597 381 5/1994 European Pat. OE.  
5-188 941 7/1993 Japan.[73] **Assignee:** Yamaha Corporation, Hamamatsu,  
Japan*Primary Examiner*—Jeffrey Donels  
*Attorney, Agent, or Firm*—Graham & James LLP[21] **Appl. No.:** 08/918,312[57] **ABSTRACT**[22] **Filed:** Aug. 26, 1997[30] **Foreign Application Priority Data**

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[51] **Int. Cl.7** G10H 7/00[52] **U.S. Cl.** 84/600; 84/609; 84/645[58] **Field of Search** 84/600, 645, 609[56] **References Cited****U.S. PATENT DOCUMENTS**

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An automatic performance data conversion system having: a storage unit for storing a rule for converting automatic performance data from a first type into a second type, the rule indicating a correspondence between data strings of the automatic performance data of the first and second types; an input unit for inputting the automatic performance data of the first type; a data converting unit for converting the automatic performance data from the first type into the second type by rearranging a data string contained in the automatic performance data of the first type input by the input unit in accordance with the rule; and an output unit for outputting the automatic performance data of the second type converted by the data converting unit.

39 Claims, 6 Drawing Sheets

